

ON AUSTRALIAN PAMBORINI, OZAENINI AND SCARITINI
(COLEOPTERA, CARABIDAE)

By M. BÄNNINGER.

T. G. SLOANE was greatly hindered in his numerous studies on Australian Carabidae by being unable to consult many of Castelnau's and Blackburn's types. The former are mainly in the Genoa Civic Museum and the latter in the British Museum. Through the courtesy of Mr. Gilbert J. Arrow and Prof. O. de Beaux I have been able to examine these, for which I express my sincere thanks. The study of the types has enabled me to give new keys to the genera *Scaraphites*, *Euryscaphus* and *Philoscaphus*, and to add remarks on some hitherto doubtful names or supposed synonymy. Descriptions are also given of two new forms of *Pamborus* and *Mystropomus*, which were among the Carabinae sent me by Mr. P. J. Darlington, jun., for naming. They had been collected by himself during his visit to Australia a few years ago.

Abbreviations: B = Coll. Bänninger; BM = British Museum (Natural History); G = Genoa Civic Museum; ZM = Zoological Museum, Berlin.

(!) signifies that the identity has been established by examination of the type. For references to Sloane's papers the year of publication is given.

Tribe PAMBORINI.

I give below a key to those species of *Pamborus* which are known to me. Geographical distribution is given only as far as it is definitely known; uncertain localities are omitted.

- 1. Elytra, in anterior half at least, with 6-8 broad and strong intervals (including the sutural one) on each, of which the 7th and 8th are some times less marked and more or less disintegrated into small tubercles. Last ventral segment of ♂ truncate 2.
- Elytra each with about 13-15 narrow carinate intervals at least in anterior half, more or less disintegrated into tubercles at sides and behind. Prothorax with lateral basal impression uniting in a concavity with marginal channel. Neck constriction behind the eyes deep in middle of head. At least the last ventral segment more or less roughly rugose or punctate 6.
- 2. Prothorax with lateral basal impression uniting with marginal channel in a broad concavity, the convex space between them widely separated from posterior margin or reaching it but incompletely and flattened (sometimes in *opacus*) 3.
- Prothorax with lateral basal impression uniting with the marginal channel at the very narrow basal margination; the space separating them very convex close to posterior margin. Last ventral segment in anterior half not roughly rugose or punctate 5.
- 3. Aedeagus dentate on inner side not far from apex. Neck constriction behind eyes more or less deep in middle of head. Elytra with 7th

interval catenulate by a varying number of interruptions, the 8th generally a little shorter but strong and entire. Surface more or less greenish generally, especially on prothorax, partly bluish, sometimes the elytra of a bronze-copper colour; such specimens of (? individually) smaller size and posteriorly more narrowed prothorax are probably *morbillosus* Boisduval). Length, 24-34 mm. Victoria to Brisbane

alternans Latreille.¹

- Aedeagus not dentate at inner side near apex. Neck constriction of head less deep or obliterated at middle 4.
4. Elytra with 7th and 8th intervals very strong, the 7th not catenulate, the 8th not or scarcely crenulate. Surface more or less greenish. Length, 25-33 mm. Southern Queensland to Canoblas Mts. and Coonabarabran, N.S.W. (Sloane, 1905) *viridis* Gory.
- Elytra with external intervals much narrower and less elevated than the inner ones, the 7th catenulate by several interruptions, the 8th more or less crenulate or disintegrated into short tubercles (but in a single ♀ from Millaa Millaa near Cairns, Mus. Comp. Zool., as in *viridis*). Elytra generally more opaque and less convex. Neck constriction more or less obliterated in middle. Length, 27-32 (-35) mm. Cairns district, N. Queensland *opacus* Géhin² (Sloane 1905).
5. Elytra with 3rd interval catenulate at least in posterior half, the 5th and 7th more or less catenulate also in anterior half; no line (or only a vestigial one) of elevated small tubercles in the striae. Length, 21-25 mm. Clarence River, Macpherson Range *macleayi* Castelnau (! G).
- Elytra with 3rd, 5th and 7th intervals entire, sometimes partly interrupted in posterior half; the striae with a line of elevated small tubercles. Length, 21-24 mm. Brisbane *brisbanensis* Castelnau (! G).
6. Elytra with reflexed border bearing a few widely placed raised serrations. Hind angles of the rather broad prothorax short and broadly advanced. Last segment of ♂ truncate. Length, 15-19 mm. Sydney to Brisbane *guerini* Gory.³
- Elytra with edge of reflexed border smooth 7.
7. Last ventral segment of ♂ truncate. Prothorax broader, with short and broadly advanced hind angles. Elytra more convex, the 4th and 8th intervals not catenulate. Length, 24-25 mm. Herberton district, N. Queensland; 1 ♂ Mac Ivor River (B) *elegans* Sloane.
- Last ventral segment of ♂ rounded as in the ♀. Hind angles of the longer prothorax narrower and strongly lobate. Elytra less convex 8.
8. Elytra with 4th, 8th and 12th intervals more or less catenulate, the 14th disintegrated into small longitudinal tubercles. Larger, broader. Length, 23-26 mm.; breadth, 8.5-10 mm. Dorrigo Plateau, west of Coff's Harbour *pradiieri* Chaudoir.

¹ The examples from the Macpherson Range and Upper Richmond River have the side margin of the prothorax broader, more grooved and not so sharply upturned as in those from the other localities, which I consider as typical.

² My interpretation is evidently identical with Sloane's, who also named specimens from the same region *opacus* Géhin from the description. But Géhin's specimen was said to come from the Murray River in N.S.W., which is probably wrong. I do not know any *alternans* to which the description applies, whilst it agrees very well with the species in question.

³ The colour varies very much: deep black, or elytra with golden margin, or the whole elytra with a coppery or brassy lustre. The var. *chaudoiri* Castelnau mentioned in Csiki's *Catalogue* has not been described, and the name does not occur in Castelnau's collection in Genoa.

Elytra with intervals much more entire and more regular, the 4th not at all or only once interrupted in anterior half, the 14th entire in anterior half. Smaller and rather narrower. Length, 20-23 mm.; breadth, 7.5-8.5 mm. Barrington Tops, N.S.W. (S. of Dorrigo Plateau)
subsp. n. *darlingtoni* Bänninger.

Pamborus pradierei darlingtoni subsp. n.

Chaudoir gives the length of his *pradierei* as 23 mm., and says expressly that the 4th, 8th and 12th intervals are catenulate and the 14th disintegrated into small longitudinal tubercles. The exact locality was unknown. These characters agree exactly with those of six specimens before me from Dorrigo Plateau, West of Coff's Harbour, N.S.W. (Mus. Comp. Zool., Cambridge, Mass., and my coll.). Sloane knew the species from the nearby Bellinger River and I have a specimen named by him from Comboyne, N.S.W. The catenulation of the 4th interval varies somewhat; in one example it is missing in the anterior half. All intervals are disintegrated at least from the anterior margin of the 4th segment. Upper side with a coppery or greenish lustre, more pronounced at margin of elytra. Length, 23-26 mm.; breadth of elytra, 8.5-10 mm.

Further south, on the Barrington Tops Plateau, 5000 ft., Mr. P. J. Darlington found in great number (about 60 specimens, of which 55 are before me) a very interesting subspecies which is named after its discoverer *darlingtoni* subsp. n. It is smaller and rather narrower. The intervals are much more entire, more regular and reach nearer the apex before being disintegrated into tubercles. The 4th is not catenulate, but in five examples there is a pit on one side or on both sides in the anterior half. The 14th is more or less entire at least in the anterior half. Lustre of elytra more greenish except near margin.

Length, 20-23 mm.; breadth, 7.5-8.5 mm. Type and cotypes in the Museum of Comparative Zoology, Cambridge, Mass., and, through the courtesy of Mr. P. J. Darlington, in my own collection. Cotypes will also be sent to the Queensland Museum.

Tribe OZAENINI.

Mystropomus regularis sp. n.

In the two species hitherto described, viz. *subcostatus* and *chaudoiri*, each elytron bears, including the sutural one, four shining ribs on the very dull ground. In *chaudoiri* traces of an additional interval are present between each two ribs; it is indicated by close shining granules, which are often dispersed also over the other parts of the elytra. In the new species, *regularis*, the alternate intervals are not obliterated nor different. Each elytron shows seven scarcely elevated stripes, produced by a stronger lustre and the denser shining granules. It is impossible to call them ribs. The 7th interval is scarcely distinguishable as a rule, whereas there are sometimes traces of the 8th interval, especially behind. The length of 13-16 mm. agrees with that of big specimens of *subcostatus*.

1 ♂, 1 ♀, Millaa Millaa, Atherton Table, 2500 ft., and 1 ♂, Lake Barrine, Atherton Table, 2800 ft., N. Queensland, collected by Mr. P. J. Darlington, jun., of the Museum of Comparative Zoology, Cambridge, Mass. Type in that Museum; the cotype will be sent to the Queensland Museum; for the gift of the specimen from Lake Barrine I am very much indebted to Mr. Darlington.

The pronotum is wider in front in *regularis* and more narrowed behind than in average specimens of *subcostatus*, but judging by the greater material of the

latter at hand the shape of the pronotum is liable to considerable variation. The distinctness of *subcostatus* and *chaudoiri* is somewhat uncertain. I have seen the type of the latter (G). Identical specimens (B) are before me from Parramatta, Richmond River and Killarney Plateau in the extreme south of Queensland (both Mus. Comp. Zool. Cambridge, Mass.). In addition to the described formation of the intervals the small size of 9–11.5 mm. and the long basal part of the pronotum, the sides of which diverge rather strongly behind, are characteristic. Amongst 16 specimens of *subcostatus* at hand from Salisbury, N.S.W. (near Barrington), as well as in 3 specimens from Gosford, near Sydney, definite approximations in all these respects occur, whereas there are hardly any in 12 specimens from the Dorrigo, west of Coff's Harbour.

Tribe SCARITINI.

Genus SCARAPHITES Westwood.

Scaraphites Westwood, 1842, *Arcana Ent.*, 1: 157.

Palpi filiform, last joint not triangular nor securiform. Triangular projection of clypeus at each side of labrum wanting or scarcely marked. Suborbital grooves to receive the antennae single, not divided. Paragenae not separated from submentum by a sharp oblique groove beginning at hind angle of mentum. Base of elytra without ocellate punctures. Elytra without a costa at sides, lateral border visible from above in its whole length. Upperside of front tibiae apically with three strong teeth, without additional denticulations above the upper tooth. The bifurcation of the two lower teeth, seen from behind, of variable position with regard to the insertion of the tarsi. Entirely black, without metallic lustre.

GENOTYPE: *Scarites silenus* Westwood 1842.

KEY TO SPECIES.

1. Elytra without widely separated strong punctures on lateral declivity, within the umbilicate series, and on apical declivity. Border at shoulder not dentate and not folded over. Prothorax very feebly sinuate on each side posteriorly, without setigerous puncture in the angle; base more or less imperfectly margined, especially at each side of peduncle. Genae strongly conically projecting below the eyes. Bifurcation of the two lower teeth of front tibiae (seen from behind) at level of insertion of tarsi; the excavate posterior surface in the vicinity of the two upper teeth coarsely rugose. Intermediate tibiae apically with a strong acute tooth. The episterna are narrower than the epipleurae at the same level in a transverse line starting from the inner anterior angle of the metepisterna 2.
- Elytra with some widely separated strong punctures on lateral¹ and apical declivities, in *lucidus* and *humeralis* on apical half only. At the level mentioned above the episterna are of about the same width as the epipleurae (*silenus* more or less excepted) 3.
2. Smaller, narrower. Umbilicate series behind the shoulder only a little farther from outer margin than in the apical third. Length, 34–40 mm. North Australia; Ord River in N.W. Australia (Sloane 1898)

laticollis Macleay 1866.²

¹ The series corresponds to the 7th stria.

² *S. gigas* is hardly more than a subspecies. Two specimens with the doubtful locality Swan River (B) of 34 and 37 mm. in length are evidently less typical *laticollis* than the ♂ I have from Darwin, N. Territory.

Larger, relatively shorter and broader. Elytra with the border more explanate, especially near the shoulder, where the umbilicate series is much more distant from it than in apical third. Prothorax more deeply emarginate in front, especially near angles, the sides more converging to base, more rounded towards the hind angles and the latter scarcely marked. Length, 37-51 mm. West Australia: Murchison District to King Sound . . . subsp. *gigas* Castelnau 1867 (! G).¹

3. Elytra with border wide at humeral angles, not folded over inwards, but with edge interrupted just behind shoulder to form a humeral prominence, projecting outwards. Prothorax shortly and strongly sinuate on each side posteriorly, angles sharply marked, subrectangular, with a setigerous puncture, basal margin more or less entire. Bifurcation of the two lower teeth of the front tibia not beyond the insertion of the tarsus; the excavate posterior surface in the vicinity of the two upper teeth very smooth. Intermediate tibiae with external apical tooth acute. Hind tibiae a little dilated at apex 4.

Elytra with border thickened and folded over inwards at humeral angles and forming a tooth (sometimes much less so in *hirtipes*). Genae somewhat projecting conically beneath eyes. Prothorax not, or very feebly, sinuate on each side posteriorly, basal angles rounded or very little marked. Bifurcation of the two lower teeth of the front tibia markedly beyond the insertion of the tarsus; the excavate posterior surface of the two upper teeth and vicinity, with rare individual exceptions (? worn), more or less rugose 5.

Elytra with border continuous at humeral angles, not or only a little thickened, not folded over and not dentate (see also *hirtipes*). The excavate posterior surface of the front tibia very smooth in the vicinity of the two upper teeth 6.

4. Border of the elytra very sparsely granulate near umbilicate series, the declivity opaque but not granulate behind. Border of prothorax very narrow and sharply reflexed, the sinuation near base generally strong and very short. Length: 22-31 mm. South West Australia (Chaudoir's locality, Melbourne, is certainly wrong)

lucidus Chaudoir 1863 (Sloane 1905).

The entire border of the elytra (as far as the row of strong punctures) and the apical declivity densely granulate and opaque. Border of prothorax broader, especially behind, and the sinuation at base generally a little longer. Front tibia with apical tooth on posterior side, at base of insertion of tarsus, longer than in *lucidus*. Length, 30-41 mm. "West Australia," Rottneest Is *humeralis* Castelnau 1867 (! G).

5. Intermediate tibia with upper apical tooth acute. The undulate striae of the head \pm confined to the frontal furrows. Border of the prothorax not or feebly crenulate. Elytra \pm regularly oval, not strongly narrowed to base. Length, 22-36 mm. New South Wales (Sydney), Eastern Victoria, King Is., Tasmania. Synonyms: *macleayi* Westw. 1842 (Cast. 1867, Sl. 1905); *intermedius* Macl. 1865 (! Sloane 1905); *insulanus* Sloane 1888 (! Sloane 1905) *rotundipennis* Dejean 1825.

Intermediate tibiae with upper apical tooth dilated and obtuse. The

¹ In one from Roebuck Bay (BM) the rugosity of the elytra is extremely rough and deep, and the striae very distinct.

- undulate striae of the head much more extended. Border of prothorax \pm crenulate. Elytra very strongly narrowed to base, greatest width much behind middle. Length, 23-34 mm. Western Victoria, South Australia. Synonyms: *crenaticollis* MacL. 1864 (! Sloane 1893); *assimilis* Sloane 1893 (! Sl. 1905) *hirtipes* Macleay 1864¹ (! Sloane 1893).
6. Front tibia with the bifurcation of the two lower teeth not or very little beyond the insertion of the tarsus. Intermediate tibia with upper apical tooth almost regularly narrowed, acute or somewhat rounded at the apex. Genae when seen from above not or only a little higher than the eyes, very sharply projecting below eyes seen from the front. Base of prothorax rounded or widely and feebly truncate, hind angles not dentate, sometimes a little marked, margin entire at base. Elytra of ♂ extremely short, little longer than broad, sides very strongly rounded, of the ♀ a little longer and the sides a little less rounded. Length, 28-43 mm. Southern West Australia. Synonyms: ♂ *bacchus* Westw. 1842; ♂ *heros* Castelnau 1867 (! G); ♀ *mastersi* Macleay 1869 (! Sloane 1905)² *silenus* Westwood 1842 (♀).
 Front tibia with the bifurcation of the two lower teeth much beyond the insertion of the tarsus. Intermediate tibia with the external apical tooth flattened and very broad to the rounded, straightly or obliquely truncate apex. Genae, seen from above, projecting conically beyond the eyes 7.
7. Hind tibia with apex strongly produced and prominent externally. Elytra with lateral border narrow at humeral angles. Sides of prothorax not, or only faintly, sinuate behind, hind angles not (or faintly) marked, posterior margin more or less obliterated. Length, 25-35 mm. South West Australia: Eucla (Sloane), Swan River (B). South Australia: Yorktown (ZM). subsp. *pacificus* Sloane 1888.
 Hind tibia less dentate at apex. Elytra with lateral border wide at humeral angles, striae faint, 8th interstice not convex. Prothorax with sides rather strongly sinuate behind and basal angles rather strongly dentate, front margin emarginate, especially near the broad angles, which are distinctly prominent. Length, 31-36 mm. "Australia" (B) *lenaeus* Westwood 1842.
 Differing from *lenaeus* by less sinuate sides of prothorax and not (or scarcely) dentate angles; front margin hardly emarginate and angles not produced. Elytral striae rather distinct, 8th interstice distinctly convex at middle. Length, 27-36 mm. South West Australia: King George Sound (Macleay, BM), "King River, south West Australia" (BM) subsp. *latipennis* Macleay 1863.³

According to Sloane's *Checklist* (1905) four species remained unknown to him: *bacchus* Westwood, *heros* Castelnau, *humeralis* Castelnau and *martini* Castelnau. There is a fifth, *confusus* Westwood, which is not mentioned in any

¹ The form of the shoulder of *hirtipes* is sometimes intermediate between that of *rectipennis* and of *pacificus*. In accordance with Sloane's decision and the rules of nomenclature (Article 28), but contrary to Cski's *Catalogue*, I give *hirtipes* priority over *crenaticollis*, though the latter is described a page before.

² As Sloane suggested, having the type before him, there seems scarcely any doubt that *mastersi* Macleay from Mt. Barker is described from a ♀ of *silenus*. A ♀ specimen from the adjacent Albany is in the British Museum.

³ *S. pacificus*, *lenaeus* and *latipennis* are very closely allied and probably at most subspecies or perhaps individual aberrations of one species.

of his papers. The study of Castelnau's types at Genoa enabled me to elucidate two of the above names: *humeralis* is closely allied to *lucidus*, and *heros* is a synonym of *silenus*. On the remaining three I make the following remarks:

The types of *S. bacchus* and *silenus* Westwood are missing from the Hope Department of Entomology, University Museum, Oxford. The description says that in *bacchus* the genae are produced into an angle beyond the eyes, while this is not so in *silenus*. But in strong males they often also project considerably beyond the eyes. Both are described from the same locality, Swan River, and comparing the two figures and descriptions, there seems to me no doubt that *bacchus* is the broader ♂ and *silenus* the more parallel ♀ of the same species, which, according to the rules of nomenclature, has to take the latter name, as Sloane chose it in his revisions. There are specimens of both sexes from Swan River named *bacchus* in Castelnau's collection, which supports the above conclusion, and I have seen a specimen from Perth (BM) labelled by Sloane as "*silenus* Westwood which is a small form of *bacchus* Westwood."

The type of *S. lenaeus* Westwood is also missing from Oxford, but there is a specimen with the label in Westwood's handwriting "*lenaeus* West., ? small male." I have examined it, through the courtesy of Prof. G. D. H. Carpenter. It is *hirtipes*, the teeth of the intermediate tibiae disagreeing with figure and description. I quite agree with Sloane's interpretation of *lenaeus*, having in my collection a previously unnamed ♀ with the very old label "N. Holl." *S. latipennis* Macleay is evidently very close to it and hardly more than a subspecies. There is a ♂ of the latter from the type locality, King George Sound, in the British Museum.

The type of *S. martini* Castelnau is not at Genoa. According to the author, the entire body is smoother than in *rotundipennis* and the punctures on the declivity are larger. This agrees very well with the example I consider to be *lenaeus*, which synonymy Sloane conjectured in 1907. But Castelnau's description does not say anything about the very different shoulders and posterior angles of the prothorax. It seems to me better to leave the decision to the future.

The description of *S. confusus* Westwood is very poor and gives no locality. It is impossible to say what it may be.

Genus EURYSCAPHUS Macleay.

Euryscaphus Macleay, 1865, *Trans. ent. Soc. N.S.W.*, 1: 187.

Palpi with the last joint triangular or securiform. Lower edge of genae prominent and usually projecting in front below the eyes. The suborbital grooves to receive the antennae are single, not divided. Paragenae with a sharp oblique, often almost transverse groove, beginning at the hind angle of the mentum and separating the paragenae from the submentum and gula. Clypeus on each side of the labrum with a more or less triangular projection. Pronotum with the base sharply bordered above peduncle. Elytra without a keel on sides, lateral border visible from above in its whole length, base with some ocellate punctures. Epiplenrae very broad anteriorly, twice as wide as the metepisterna, or more. Upperside of front tibia with two strong teeth, their bifurcation, when viewed from behind, much above the insertion of the tarsus; a variable number of much smaller denticulations above the upper tooth. Mesotibia with the apical tooth acute, often rather small. Elytra very broad and short, in the ♂ generally nearly circular, more elongate in the ♀. Entirely black, without metallic lustre.

The affinities of some *Euryscaphus* with the genus *Carenum* are very great. I have from the Boileau collection two very large ♀ specimens (length, 34-35 mm.; breadth of elytra, 13 mm.) from "N.W. Australia" which were named *E. hopei*, and for some time I also considered them to be a *Euryscaphus* near *politus*, in spite of their shape, which is too oblong for the genus. But the paragenae are not defined behind by the deep oblique groove which is so characteristic of *Euryscaphus*; the genae do not project below the eyes and the front tibiae are strongly tridentate. In Sloane's classification of *Carenum* (1900) into groups one comes near the *macleayi* and *transversicollis* groups, but my specimens do not agree with any of the species in question. In the *anthracinum* group of *Carenum* and the groups with the penultimate joint of the labial palpi short and swollen, grooves like those in *Euryscaphus* separate the paragenae from the submentum and the gula.

GENOTYPE: *Euryscaphus angulatus* Macleay 1865.

KEY TO SPECIES.

1. Posterior angles of pronotum rounded, the base more or less rounded between them or more or less lobate above peduncle 2.
 Posterior angles of pronotum upturned and more or less rectangular.
 Elytra without a discoidal puncture on apical third 6.
2. Elytra with a discoidal puncture about one third from apex 3.
 Elytra without a discoidal puncture on apical third 4.
3. Lateral border of elytra very narrow, except near shoulder, feebly rounded to the shoulder-tooth which is very distant from the peduncle. Pronotum with lateral and basal borders rather narrow, basal border normal on each side of peduncle, epipleurae not (or hardly) visible from above, base not (or scarcely) lobate, the wide longitudinal impression at a considerable distance from lateral border wanting or very shallow. Length, 31-43 mm. South Australia, Western New South Wales, Victoria. Synonyms: ♂ *bipunctatus* Macleay 1865 (Sloane 1893); ♂ *howitti* Castelnau 1867 (! Sloane 1893); ♀ *tatei* Blackburn 1887 (! BM); *ferox* Sloane 1888 (! 1890), ♂ *chaudoiri* Blackburn 1892 (! BM)
obesus Macleay 1863 (! Sloane 1893) ♀.
 To be separated from *obesus* by the very broad lateral border of the pronotum and the stronger wide impression at a considerable distance from lateral border. Length, 32 mm.; breadth, 13 mm. South Australia (Lake Eyre) subsp. *sulcicollis* Blackburn 1892 (! BM).
 Elytra with lateral border broad to apex, anteriorly shortly and strongly rounded to the shoulder-tooth (sometimes more or less obliterated), which is much nearer to the peduncle than in *obesus* and *sulcicollis*. Lateral border of pronotum very broad, base generally strongly lobate, the border very narrow on each side of peduncle and the epipleurae visible from above, generally with the same wide shallow impression at a considerable distance from lateral border as in *sulcicollis*. Genae more projecting below eyes than in the two preceding forms. Length, 31-44 mm. South-West Australia. subsp. *ebeninus* Sloane 1890.¹
4. Reflexed border of elytra ending at humeral angle and forming a very thick upturned humeral projection, less so in the ♀. Pronotum with base rounded and strongly produced backwards above peduncle, lateral

¹ There can hardly be any doubt that the three forms are subspecies of a single species.

margin more or less crenulate, epipleurae more or less broadly visible from above on each side of peduncle. Very large species, ♀ more elongate than ♂, which has almost round elytra. Length, 35-51 mm.; breadth, 15-24 mm. Central and North Australia, West Australia (Lake Darlott). Synonym: ♀ *titanus* Sloane 1889 (! Sloane 1893)

waterhousei Macleay 1864.

"Size moderate, elytra narrow and narrowly rounded behind." "Probably founded on a small form of *waterhousei*." Length, 31-33 mm.; breadth, 12-13 mm. Bourketown District, N. Queensland. Ex Sloane 1893, 1897 *atratus* Sloane 1893.

Reflexed border of elytra extending more or less beyond humeral angle, not forming a thickened upturned projection. Lateral border of pronotum not crenulate, epipleurae not or very narrowly visible from above on each side of peduncle 5.

5. Elytra rounded, not distinctly angular, at shoulder. (Base of pronotum rounded and more or less lobate above peduncle.) Length, 22-33 mm.; breadth, 10-14.5 mm. S. Queensland, New South Wales, Victoria, ? Eastern South Australia, "Central Australia." Synonyms: *minor* Macleay 1865 (! Sloane 1905); *affinis* Castelnau 1867 (! Sloane 1893 = *minor* Macleay); ♀ *hopei* Castelnau 1867 (! G); *arenarius* Sloane 1888 (! Sloane 1890 = *minor* Macleay)

dilatatus Macleay 1865 (! Sloane 1905).

Elytra very distinctly angular at shoulder. (Base of pronotum more truncate, not or less lobate above peduncle.) Length, 25-34 mm.; breadth 11-15.5 mm. S. Queensland, South, Central, and West Australia, as far North as Murchison River. Synonyms: ♀ *politus* Sloane 1893; ♂♀ *concolor* Sloane 1893; ♂ *terrenus* Sloane 1894

carbonarius Castelnau 1867.

6. Supraorbital pore present. (Frontal sulci less deep behind than in *subsulcatus*, and fading out in the generally somewhat depressed neck.) Central carina of mentum reaching the end of the tooth; its sides normally bordered. Marginal border of pronotum, including posterior angles, much more widely upturned, with an anterior marginal puncture and a broad flat depression inside anterior angles. Shoulders much more rounded off than in *subsulcatus*. Length, 33-36 (-42) mm. "Queensland" (Sloane, *Check List* 1905); Peak Downs (ZM); 1 ♀ without locality (B) *angulatus* Macleay 1865.

Supraorbital pore wanting. (Frontal sulci sharp and deep behind, no neck constriction.) Central carina of mentum reaching the strongly upturned sides of the tooth. Lateral border of pronotum strongly but not very broadly upturned, without setigerous punctures, transverse impression behind front margin hardly perceptible even near anterior angles. Shoulders square, strongly marked. Length, 22-29 mm. South Australia (Ouldea) . . . *subsulcatus* Blackburn 1887 (! BM).

E. carbonarius Castelnau and **dilatatus** Macleay.

It is almost impossible to name specimens belonging to group 5 from the keys and descriptions hitherto published. A specimen from Queensland (BM) named *dilatatus* Macleay by Sloane gave a hint. Another specimen which I recently saw in the British Museum collection simplifies the question considerably. It

is from Norseman, W.A., and was obtained from Sloane himself in 1923, thus many years after his latest publication on the genus. Perhaps he had again examined Castlenau's type in the Howitt collection (*see* Sloane 1905, 1907). It bears the label "*E. carbonarius* Cast." with *politus* Sloane, *concolor* Sloane and *terrenus* Sloane as synonyms. According to the descriptions and the material at hand the differences of the pronotum are evidently subject to some variation, which greatly complicates interpretation of the descriptions. The shape of the shoulder affords a better character and it agrees very well with the geographical distribution. There is, however, some doubt, as the type of *carbonarius* is said to come from Cooper's Creek, which would be the extreme eastern point of distribution, and *E. affinis* Castelnau is from the same locality and was identified from the types by Sloane as *minor* Macleay = *dilatatus* Macleay. It seems to be somewhat doubtful whether the synonymy of the nine names is quite correct.

Genus **PHILOSCAPHUS** Macleay.

Philoscaphus Macleay, 1871, *Trans. ent. Soc. N.S.W.*, 2: 96.

Palpi with the last joint triangular or securiform. Lower edge of genae not dentate nor projecting over the eyes. Suborbital grooves to receive antennae, single, not divided. Paragenae not separated from mentum and submentum by an oblique groove (sometimes a little marked in *barnardi*). Clypeus on each side of labrum with a triangular projection. Elytra with one or two sharp costae on each side, which disappear near apex. Base with some ocellate punctures, often more or less disappearing in the rough sculpture. Shoulder dentate. Epipleurae broad. Upper side of front tibia more or less tridentate, with or without further denticulations above the upper tooth. The bifurcation of the two lower teeth, seen from behind, above the insertion of tarsus. Colour variable.

GENOTYPE: *Carenum tuberculatum* Macleay 1863.

KEY TO SPECIES.

1. Disc of the elytra perfectly flat and quite smooth and opaque on inner side of costa. Lateral margin and base of thorax and lateral margin of elytra, as well as an irregular patch inside shoulder, of a bright green or red-golden colour; ventral surface cyaneous. Costa following the curvature of the elytra widely separated from the margin, which is visible from above in its whole length. Length, 14-16.5 mm. South Queensland. *barnardi* Macleay 1887.
- Disc of elytra with a very rough sculpture on inner side of costa (tubercles, elevations). Upperside black 2.
2. Disc of elytra flat on inner side of costa, with a few longitudinal impressions like striae and a number of transverse and irregular ones, giving a very uneven appearance. Costa seen from above very distant from the lateral margin, towards which it slopes almost vertically; lateral margin broadly visible from above in its whole length.¹ Length, 16.5-18.5 mm. S.E. New South Wales. (Macleay 1873, 3: 324)
carinatus Macleay 1864.

¹ The shape of elytra and position of the costa are, except for the rough sculpture extending to the lateral margin and black colour, much as in *barnardi*.

Lateral margin of elytra very narrowly visible from above in anterior half or somewhat hidden by the costa. Disc more or less convex on inner side of costa, with longitudinal rows of broad elevations and scattered tubercles in the intervening space. Epipleurae very broad. Head smooth or only with traces of rugae between the eyes and the furrows. Thorax strongly lobate above peduncle, disc generally more or less smooth or with moderately deep transverse rugae 3.

Lateral margin of elytra completely hidden in its whole length, except just behind shoulder and for a certain distance at apex, by the strongly overhanging costa; the large elevations generally less numerous, the sculpture more disintegrated into more numerous smaller tubercles. Epipleurae considerably narrower. Thorax strongly lobate above peduncle, disc with very strong transverse rugae 4.

3. Elytra with a single costa at side (generally with marked bifurcation at level of 2nd or 3rd segment). Length, 21-32 mm. New South Wales, Queensland (Kuranda, B), Eastern South Australia

tuberculatus Macleay 1863.

Elytra with two costae at side, at least for some extent, corresponding to the 7th and 8th interstices, the 8th more or less obliterated anteriorly or fused with the 7th, and both (especially the 7th) often more or less interrupted posteriorly. Length, 23-33 mm. West and South Australia. Synonyms: *lateralis* Macleay 1873 (! Sloane 1905); *crassus* Blackburn 1887 (Sloane 1905); *tepperi* Blackburn 1887¹

costalis Macleay 1873 (! Sloane 1905).

4. Disc of elytra with one or two rows, among the irregular tubercles, of stronger or more or less distinct tubercles which correspond to the 3rd and 5th interstices, the latter beginning at about middle of upper visible part of basal carina. Length, 22-30 mm. S.E. Queensland to Kuranda. Synonym: *duboulayi* Blackburn 1892 (! BM)

mastersi Macleay 1871.

Disc of elytra with a semi-interrupted costa of two-thirds of their length, beginning at middle of upper part of basal carina. Elytra narrower, with base decidedly narrow. Sculpture of lateral declivity more tuberculate above lateral channel, with a row of narrow elevations, forming the line of a broken costa. The prosternum has the intercoxal part lightly channelled, not deeply excavate at the base. Length, 22.5 mm.; breadth, 8.3 mm. North Queensland. Ex Sloane

bicostatus Sloane 1905.

¹ Sloane (1905: 114), from description, placed *P. tepperi* Blackburn (Angebackina) in the synonymy of *tuberculatus*, though the description speaks of two costae at middle of each elytron for an extent of 2 mm. I cannot find any other difference between *tuberculatus* and *costalis* except the presence of one or two costae. *P. tepperi* seems to be founded on an example connecting them. There is a specimen (BM) from Callabonna identified as *tepperi* Blackburn by A. M. Lea which, as well as the localities, supports that suggestion.